



PM400 Composite Solid Lubricant

DATA SHEET

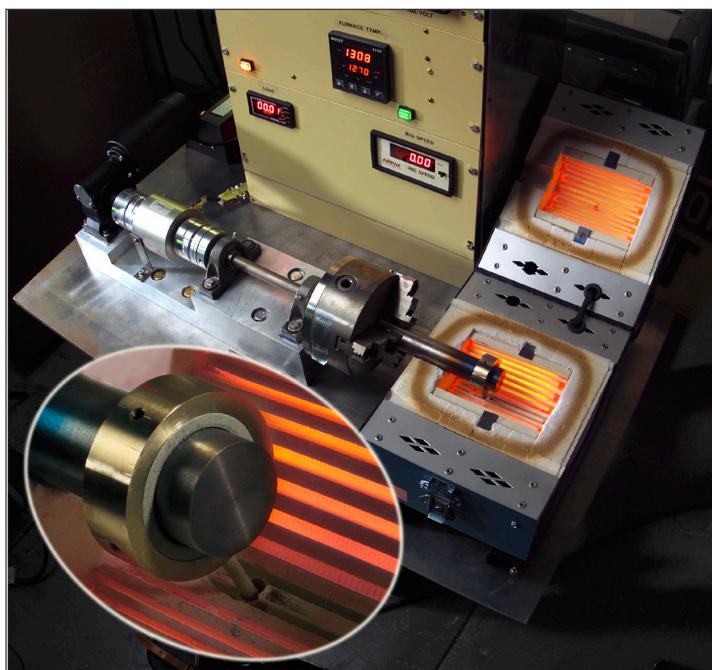
NASA Glenn innovators have developed the most advanced composite solid lubricant, composed of nickel-molybdenum-aluminum matrix alloy, for high temperature tribological applications.

Characteristics:

- Low cost
- High dimensional stability for high temperature applications
- High strength
- High density
- Smooth surface texture (self-polishing)
- Extreme oxidative stability
- Ideal for low speed sliding contact under moderate loading in extreme environments
- Excellent dimensional stability, good tribological properties

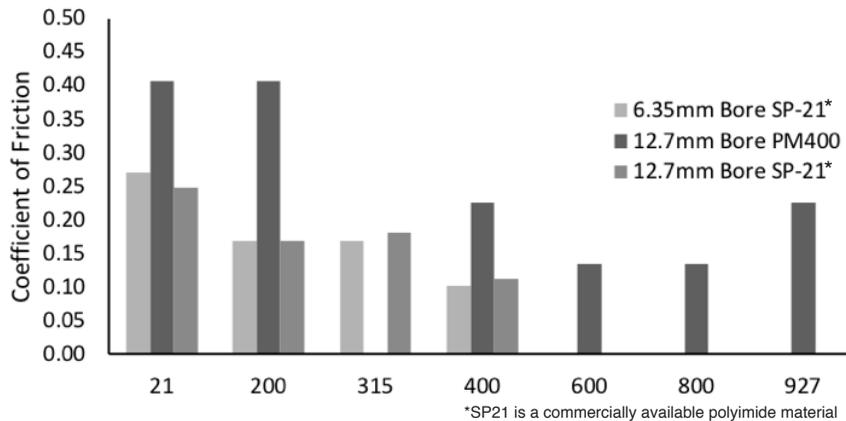
Applications:

- Bushings
- Slider bearings
- Sliding wear plates
- Heat treat ovens
- High temperature industrial conveyor chains
- Bleed air valves
- Process control valve stems
- Butterfly valve stems
- Waste gate valves for turbochargers
- High-temperature applications where sliding friction and wear are concerns



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Coefficient of Friction vs. Temperature °C

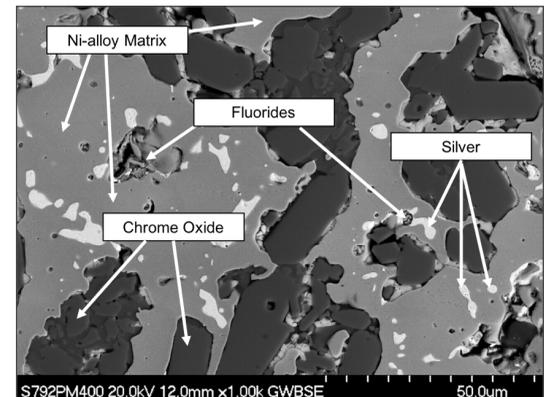


PM400 Coating Composition

PM400 composition	Weight %
Binder	Ni Alloy/70%
Hardener	Cr ₂ O ₃ /20%
Low Temp Lubricant	Ag/5%
High Temp Lubricant	Fluorides (BaF ₂ -CaF ₂ eutectic)/5%

Technical Data

Material Properties	Value	Unit
Maximum load (estimated)	~15	MPa
Operating temperature (max)	927	°C
Coefficient of Thermal Expansion	~13	x 10 ⁻⁶ /°C
Coefficient of Friction (below ~400°C)	~0.4	
Coefficient of Friction (above ~400°C)	~0.2	



Friction Summary

PM400 Bushing-Nickel Alloy Shaft, +/-15° Osc., 1Hz

Nominal Shaft Diameter	Test Load, N	Test Temperature, °C	# Test Cycles	Torque, N-m	Calculated Friction Coefficient
6.35	84	200	1,000,000	0.28	0.25
6.35	84	400	1,000,000	0.38	0.34
6.35	84	600	1,000,000	0.22	0.20
6.35	84	800	1,000,000	0.28	0.24
6.35	84	927	1,000,000	0.19	0.19
12.7	180	25	1,000,000	1.7	0.41
12.7	180	200	1,000,000	1.8	0.44
12.7	180	400	1,000,000	0.88	0.20
12.7	180	600	1,000,000	0.58	0.15
12.7	180	800	1,000,000	0.57	0.14
12.7	180	927	1,000,000	1.1	0.26
12.7	410	25	1,000,000	3.4	0.36
12.7	410	600	1,000,000	1.89	0.20